



Chapter 28

First Aid and Emergencies

Lesson 1

Providing First Aid

Lesson 2

CPR and First Aid for Shock and Choking

Lesson 3

Responding to Common Emergencies

Lesson 4

Treatment for Poisonings





FOLDABLES™

Study Organizer

Before You Read

Make this Foldable to help you organize what you learn about providing first aid. Begin with a sheet of 8½" x 11" paper or notebook paper.

▶ Step 1

Fold a sheet of paper in half along the long axis.



▶ Step 2

Fold into thirds.



▶ Step 3

Cut the top layer along both folds. Label as shown.



As You Read

As you read and discuss the material in the chapter, use your Foldable to record what you learn about the three Cs, the first steps to take in an emergency situation.

Quick Write

Using Visuals. Your response to a medical emergency can be critical to the recovery of an injured person. In what specific ways do you think providing the correct first-aid techniques will help the recovery of this injured person?



Lesson 1

Providing First Aid

VOCABULARY


first aid
universal precautions

YOU'LL LEARN TO

- Relate the nation's goals and objectives to individual, family, and community health and appropriate first-aid procedures.
- Understand the importance of learning first aid.
- Analyze strategies for responding to accidental injuries.



Write a paragraph explaining the importance of learning first-aid procedures.

 **Universal precautions protect both the caregiver and the victim from coming into contact with blood and other body fluids that may contain pathogens.**

Imagine that you are taking care of your neighbor's son when he suddenly falls off his bike and cuts his knee. Suppose that you are in the school lunchroom and your best friend begins to choke. Do you know what to do in either of these situations? Your response to an accident or an emergency can minimize injury and might even save a life.

First Aid

First aid is the immediate, temporary care given to an ill or injured person until professional medical care can be provided. First aid is administered in the seconds and minutes following an emergency in which someone becomes ill or injured. Learning first-aid procedures is an important step in meeting the nation's health goals and objectives for individuals, family, and communities described in *Healthy People 2010*. Using the proper first-aid procedures can reduce the number of people who sustain further injury or die in the absence of early and effective treatment.





Universal Precautions

Some infectious agents, such as the HIV and hepatitis B viruses, can be transmitted through contact with blood and other body fluids. Because of this risk, it is important that you use universal precautions when you administer first aid. **Universal precautions** are actions taken to prevent the spread of disease by treating all blood and other body fluids as if they contained pathogens. Universal precautions include strategies such as wearing protective gloves when there is a possibility of touching blood or other body fluids, using a mouth-piece or other protective ventilation devices for breathing emergencies, and washing your hands before and after providing first aid.

Responding to an Emergency

Recognizing an emergency is the first step in responding to it. Common indicators of an emergency include unusual sights, sounds, odors, and behaviors. If you find yourself at the scene of an emergency, remain calm and follow the steps in **Figure 28.1**, which were developed by the American Red Cross.

FIGURE 28.1

CHECK, CALL, CARE

These are the first steps to take in an emergency situation.

1. Check the scene and the victim.

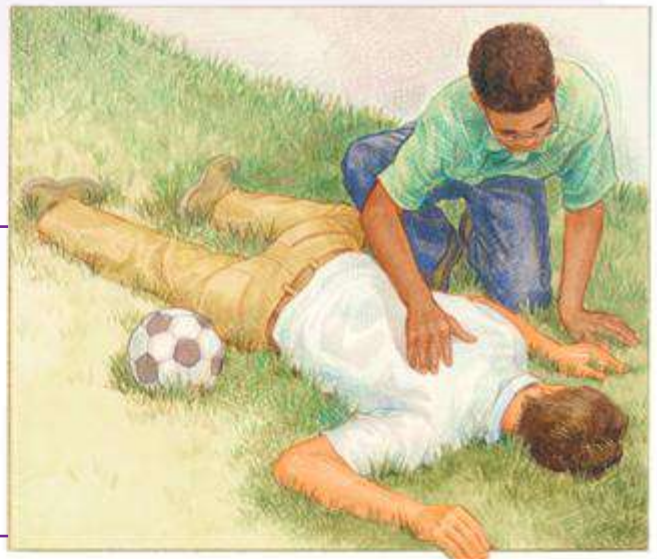
Look around to be sure that the scene is safe. Be alert for dangers such as spilled chemicals, traffic, fire, escaping steam, downed electrical lines, and smoke. Determine the number of victims. If no immediate danger is evident, do not move the victim. Move the victim only if his or her life is threatened.

2. Call for help.

Call the local emergency number or 911. Answer all of the dispatcher's questions. Do not hang up until the dispatcher does. If possible, have someone else make the call so that you can stay with the victim. If you are the one calling for help, finish the call as quickly as possible, and return to the victim.

3. Provide care for the victim.

If possible, get the victim's permission before giving first aid. Always address life-threatening emergencies first. Take care of anyone who is unconscious; who is not breathing or is having trouble breathing; who shows no signs of circulation, such as moving or coughing; or who is bleeding severely. If you aren't sure that the victim is conscious, tap him or her on the shoulder and ask, "Are you okay?"






Types of Injuries

Not all injuries are emergencies. Splinters and scrapes, for example, are relatively minor injuries, and the first-aid treatment for them is usually quick and simple. Other injuries are severe enough to endanger life or cause serious physical damage.

Open Wounds

Open wounds are one type of injury. Treatment depends on the severity and type of wound:

 Knives and other sharp objects can cause lacerations. When using any sharp tool, pay attention to what you are doing. *What other strategies can you apply to reduce the risk of lacerations?*



▶ **Abrasion.** If the skin is scraped against a hard surface, tiny blood vessels in the outer layers of the skin break, resulting in an abrasion. Because of the way the injury occurs, dirt and bacteria can easily enter the site. Therefore, it's especially important to clean the wound to prevent infection and speed healing.

▶ **Laceration.** A laceration is a cut caused by a sharp object, such as a knife or broken glass, slicing through the layers of skin. This type of laceration usually has smooth edges. A hard blow from a blunt instrument or tearing the skin may cause lacerations with jagged edges. All lacerations are accompanied by bleeding. Deep lacerations can result in heavy bleeding, as well as damage to nerves, large blood vessels, and soft tissues. Infection may also occur.

▶ **Puncture.** A puncture wound is a small but deep hole caused by a pin, nail, fang, or other object that pierces the skin. Puncture wounds do not usually cause heavy external bleeding, but they may cause internal bleeding if the penetrating object damages major blood vessels or internal organs. Puncture wounds carry a high risk of infection, including tetanus.

▶ **Avulsion.** An avulsion results when tissue is partially or completely separated from the body. A partially avulsed piece of skin may remain attached, but it hangs like a flap. Heavy bleeding is common. Sometimes a body part, such as a finger, may be severed. With today's medical technology, severed body parts can sometimes be reattached surgically. Pack the severed part in ice or ice water, if possible, to preserve the tissue. Immediately call for professional medical assistance.



Health Skills Activity



How to Handle a Puncture Wound

Jamie, 16, is looking after Jason, her 7-year-old neighbor, for the afternoon. They are in the backyard playing with toy cars and trucks. After a while, Jason gets up and walks over to the toolshed.

"Jason," Jamie calls, "you're not supposed to go over there. Come back here and pull out my car with your tow truck. I'm stuck in the mud."

Jason starts to walk back, and suddenly starts screaming and holding his foot.

"Oh, my gosh!" Jamie cries. She looks at Jason's foot.

Jason has stepped on a nail, which has punctured his foot. Jamie notes that the wound looks deep but doesn't appear to be bleeding heavily.

What should Jamie do?

What Would You Do?

Describe in detail how you would apply these first-aid steps to Jamie's situation.

1. Protect yourself from infections spread by contact with blood.
2. Control any bleeding.
3. Clean the wound.
4. Protect the wound.
5. Get medical attention if necessary.

First Aid for Bleeding

To stop blood flow from an open wound, first put on clean protective gloves, if possible. Wash a minor wound with mild soap and running water to remove dirt and debris. Do not attempt to clean a severe injury such as an avulsion. Always wash your hands before and after providing care, even if you wear gloves.

To control bleeding:

- ▶ Cover the wound with sterile gauze or a clean cloth and press firmly.
- ▶ If possible, elevate the wound above the level of the heart.
- ▶ Cover the gauze or cloth dressing with a sterile bandage.
- ▶ If necessary, cover the dressing with a pressure bandage and/or use pressure point bleeding control (see next page).
- ▶ Call for help or have someone else do so.

Applying pressure to a wound will often stop the flow of blood. **What precautions should you take before assisting someone with an open wound?**





A pressure bandage may be used to maintain continuous pressure on a wound. Identify a situation that would require the use of a pressure bandage.

How to Apply a Pressure Bandage

Roller bandages can be used to maintain continuous pressure on a wound and control bleeding. A bandage applied snugly to the injured area will hold the dressing in place and facilitate blood clotting. To use a roller bandage:

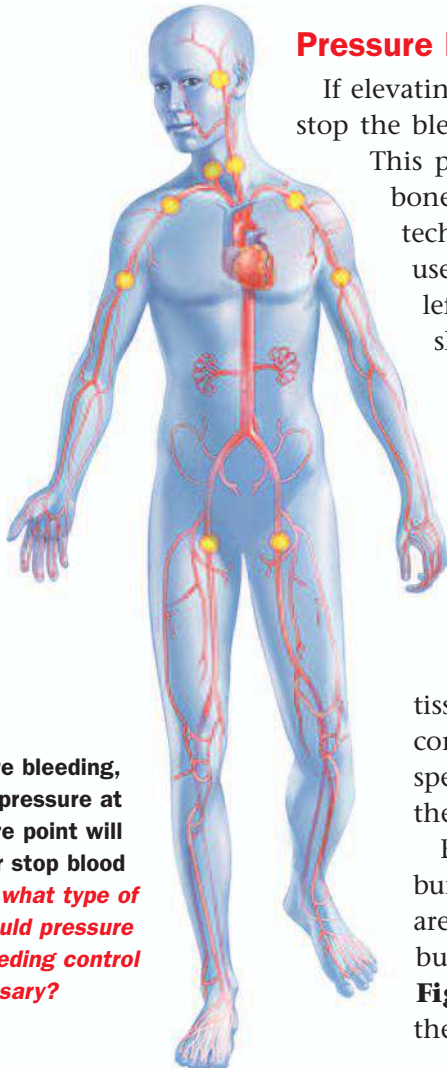
- ▶ Place a dressing over the wound.
- ▶ Secure the roller bandage over the dressing.
- ▶ Using overlapping turns, cover the dressing completely, as shown in the diagram at the left.
- ▶ Secure the roller bandage in place by splitting its end into two strips. Tie the split bandage ends tightly over the wound.
- ▶ Make sure that the bandage is not so tight that it cuts off circulation. It should be just tight enough to maintain pressure on the wound.

Pressure Point Bleeding Control

If elevating the wound and applying a pressure bandage do not stop the bleeding, pressure point bleeding control must be used.

This procedure involves pressing the main artery against a bone to stop blood supply to the injured area. Because this technique stops normal blood circulation, it should be used only when absolutely necessary. The diagram at the left shows the location of the points at which pressure should be applied when using this technique.

A person who requires pressure point bleeding control is seriously injured and possibly in shock. Professional medical assistance is necessary and should be consulted before this procedure is applied.



For severe bleeding, applying pressure at a pressure point will reduce or stop blood flow. For what type of injury would pressure point bleeding control be necessary?

Burns

Heat, radiation from the sun, certain chemicals, and electricity can all burn the skin and soft tissues of the body. Burns caused by heat are the most common. Those caused by chemicals or electricity require special first-aid procedures—for information on treating these types of burns, contact the American Red Cross.

Burns are classified according to depth: first-degree burns are superficial, and second- and third-degree burns are deep. Minor burns can be treated at home. Severe burns, however, require professional medical care. **Figure 28.2** shows the three classifications of burns and the treatment for each.



FIGURE 28.2

TYPES OF BURNS AND TREATMENT

The severity of the burn determines the type of burn and treatment.

First-degree burn

In a **first-degree burn**, only the outer layer of skin is burned and turns red. Cool the burn with cold running water or by immersing it in cold water (not ice) for 10 minutes. A clean, cold, wet towel will help reduce pain. Pat the area dry, and cover it with a sterile bandage.



Second-degree burn

A **second-degree burn** is one in which the top several layers of skin are damaged. The skin will have blisters and appear blotchy. Cool the burn with cold water (not ice), and elevate the burned area. Wrap the area loosely with a sterile, dry dressing. Do not pop blisters or peel loose skin. Seek professional medical attention.



Third-degree burn

A **third-degree burn** is a serious burn in which deeper layers of skin and possibly fat, muscle, nerves, and bone are damaged. Call for professional medical help immediately. Cool the burn with large amounts of cold water (not ice). Cover the area with a dry, sterile dressing or clean cloth.



Lesson 1 Review

Reviewing Facts and Vocabulary

1. Define *first aid*.
2. Relate the nation's health goals and objectives to individual, family, and community health: Explain why knowing first-aid procedures can help achieve the goals of *Healthy People 2010*.
3. Why is it necessary to use universal precautions when giving first aid to a person who is bleeding?

Thinking Critically

4. **Synthesizing.** Analyze and develop a strategy for responding to an accidental injury such as a minor laceration.
5. **Analyzing.** Describe a strategy for responding to an accidental injury such as a second-degree burn.

Applying Health Skills

Communication Skills. What would you say to a teen who isn't sure why he or she should learn first aid? Write a dialogue in which you use effective communication skills to explain to the teen the importance of knowing first aid.



WORD PROCESSING Use word-processing software to write your dialogue. See health.glencoe.com for tips on using word-processing software.





Lesson 2

CPR and First Aid for Shock and Choking

VOCABULARY

chain of survival
defibrillator
cardiopulmonary
resuscitation (CPR)
shock


YOU'LL LEARN TO

- Identify the appropriate steps for responding to life-threatening emergencies.
- Analyze strategies for responding to an emergency situation requiring CPR.
- Analyze strategies for responding to a shock or choking victim.



Write a paragraph describing what you know about CPR.



 The increased availability of AEDs has led to improved survival rates for heart-attack victims.

In an emergency you need to act quickly—the first few minutes after a medical crisis are usually the most critical. The key is knowing what to do, remaining calm, and making a decision to act.

Life-Threatening Emergencies

If the victim in an emergency is unresponsive, you must begin immediately the **chain of survival**, a sequence of actions that maximize the victim's chances of survival. If the victim is an adult, you can begin the first two links in the chain: call 911 and begin CPR. The next two links, early defibrillation and transfer to advanced care, are usually the responsibility of the emergency medical personnel when they arrive. A **defibrillator** is a device that delivers an electric shock to the heart to restore its normal rhythm. An automated external defibrillator (AED) is a handheld device that almost anyone can be trained to use. AEDs have not been approved for use on children who are younger than eight years old or who weigh under 55 pounds.





CPR

A person whose breathing and heartbeat have stopped may need CPR. **Cardiopulmonary resuscitation (CPR)** is a life-saving first-aid procedure that combines rescue breaths with chest compressions, supplying oxygen to the body until normal body functions can resume. You must be properly trained by a professional and certified before administering CPR.

CPR for Adults

The steps of CPR are known as the ABCs—airway, breathing, and circulation. If an adult victim is unresponsive, tap him or her and ask in a loud voice, “Are you okay?” If the victim doesn’t respond, start the chain of survival. First, call 911 or have someone else do so. Then kneel beside the victim and follow the steps developed by the American Heart Association, which are shown in **Figures 28.3** and **28.4** on page 744.

FIGURE 28.3

THE ABCs OF ADULT CPR

A **Airway.** Look inside the victim’s mouth. Remove anything you see blocking the airway. If you don’t suspect head or neck injuries, lay the person flat on a firm surface. Gently tilt the head back by lifting the chin with one hand while pushing down on the forehead with the other. If you suspect head or neck injuries, do not move the victim. Open his or her airway by lifting the jaw instead.

B **Breathing.** Look, listen, and feel for breathing. Look for chest movement. Listen at the victim’s mouth for breathing. Feel for exhaled air on your cheek. If the victim is not breathing normally, begin rescue breathing:

1. Keeping the victim’s head in the proper position, pinch the nostrils shut.
2. Place your mouth over the victim’s mouth, forming a seal. Give two slow breaths, each about 2 seconds long. The victim’s chest should rise with each breath.

C **Circulation.** Check for signs of circulation, such as breathing, coughing, or movement. If there are no signs of circulation, a person trained in CPR should begin chest compressions immediately (see **Figure 28.4**). If the victim responds (coughs or moves, for example) but is still not breathing normally, give one rescue breath every 5 seconds.

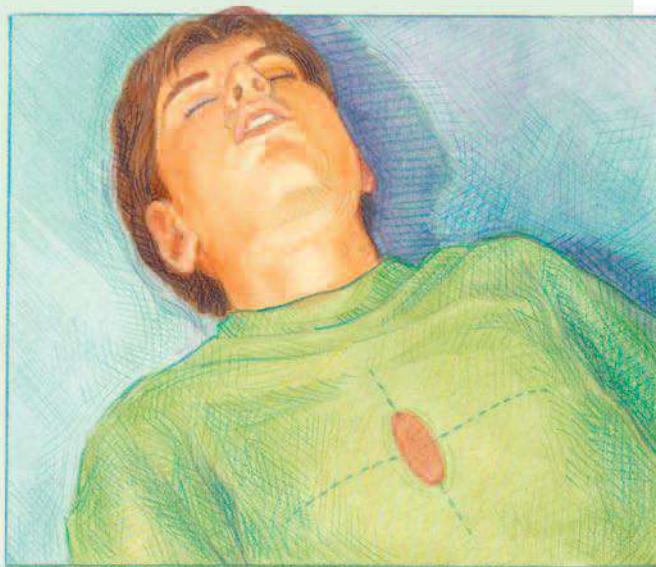




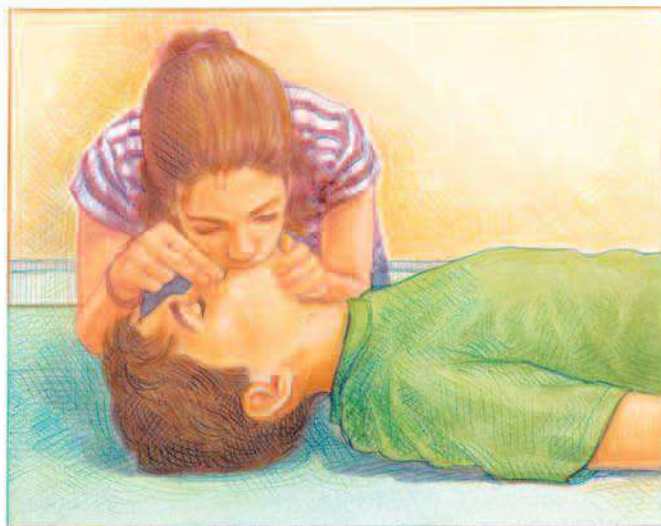
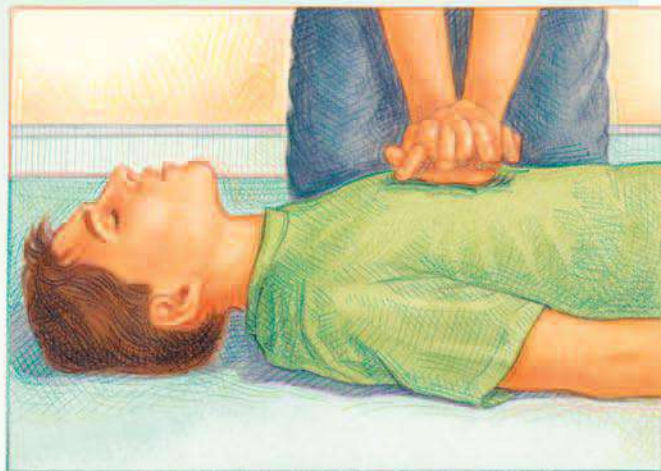
FIGURE 28.4

ADULT CPR CYCLES

1 **Position your hands.** To begin chest compressions, find a spot on the lower half of the victim's breastbone, right between the nipples. Place the heel of one hand on that point, and interlock your fingers with the fingers of the other hand. Don't allow your fingers to rest on the victim's ribs.



2 **Begin chest compressions and rescue breathing.** Lean over the victim so that your shoulders are directly above your arms and hands. Lock your elbows and press straight down quickly and firmly at a rate of about 100 compressions per minute. Allow the chest to spring back between compressions. After every 15 compressions, give two rescue breaths. Complete four continuous cycles (just over 1 minute) of CPR, then check for signs of circulation. Continue CPR, checking for signs of circulation every few minutes. If the victim begins to respond, stop chest compressions. If the victim coughs or moves but is still not breathing, give one rescue breath every 5 seconds until help arrives. If the victim begins breathing normally, turn the victim onto his or her side and wait for professional medical help.





Exploring Issues

Should Schools Require Teens to Take a CPR Course?

Heart attacks are the most common medical emergencies in the United States. Many deaths could be prevented, however, by people performing CPR. As a result, organizations such as the American Heart Association and the American Red Cross have certified thousands of people in CPR. To increase the number of trained rescuers, many people think CPR certification should be a high-school graduation requirement. Others disagree. Here are two points of view.

Viewpoint 1: Michael P., age 15

I don't think that all high-school students should be required to take a CPR course. It should be a personal choice. Health courses need to focus more on risk behaviors that affect young people, such as using tobacco, alcohol, and other drugs. Teens who want CPR training can go to their local chapter of the Red Cross or American Heart Association.

Viewpoint 2: Sydney J., age 15

Every year in the United States, 350,000 people die of sudden heart attacks. Many of these people could be saved if CPR were administered. It makes sense that the more people who are trained in CPR, the fewer people who may die. Many of these courses are taught by teachers who instruct students in the use of AEDs as well as in oxygen administration. Both of these technologies have improved the survival rates of heart attack victims.

ACTIVITIES

1. Should high schools require teens to take a CPR course? Why or why not?
2. CPR training "obligates" people to use their skills when they witness an emergency situation. How well do you think teens could handle this responsibility?

CPR for Infants and Children

Infants and children in life-threatening emergencies aren't treated in exactly the same way that adults are. For example, you shouldn't use an AED on an infant or a child. Likewise, you can't use the same amount of force in chest compressions. **Figures 28.5** and **28.6** on the next page show how to perform CPR on infants and children. These steps were developed by the American Heart Association. For an infant or a child, provide about one minute of CPR *before* calling 911 for help.



FIGURE 28.5

THE ABCS OF INFANT AND CHILD CPR

A Airway. Look inside the victim's mouth. Remove anything you see blocking the airway. If you don't suspect head or neck injuries, lay the victim flat on a firm surface. Gently tilt the head back by lifting the chin with one hand while pushing down on the forehead with the other. If you suspect head or neck injuries, do not move the victim. Instead, open his or her airway by lifting the jaw.

B Breathing. Look, listen, and feel for breathing. *Look* for chest movement. *Listen* at the victim's mouth for breathing. *Feel* for exhaled air on your cheek. If the victim is not breathing, begin rescue breathing:

Keep the victim's head in position. For a child, pinch the nostrils shut and seal your mouth over the victim's mouth. For an infant, seal your mouth over the mouth and nose. Give two slow breaths, each about 1 to 1½ seconds long. The chest should rise with each breath.

C Circulation. Check for signs of circulation, such as breathing, coughing, or movement. If there are no signs of circulation, a person trained in CPR should begin chest compressions immediately (see Figure 28.6). If the victim responds (coughs or moves, for example) but is still not breathing normally, give one rescue breath every 3 seconds for either a child or an infant.

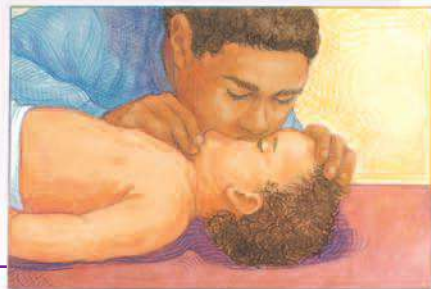
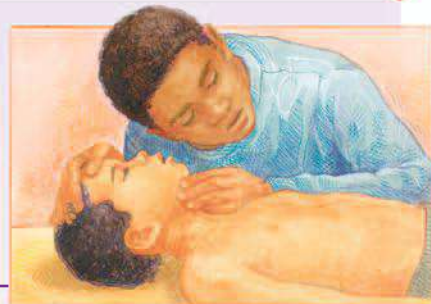


FIGURE 28.6

INFANT AND CHILD CPR CYCLES

1 Position your hands. With one hand, keep the victim's head tilted, unless you suspect head or neck injury. For a child, place the heel of your other hand on the lower half of the breastbone and position your shoulder directly over your straightened arm and hand. For an infant, imagine a line drawn between the nipples. Place two or three fingers of your hand on the lower half of the infant's breastbone, about one finger's width below the imaginary nipple line.

2 Begin chest compressions and rescue breathing. Compress the victim's chest downward approximately one-third to one-half the depth of the chest at a rate of *about* 100 times per minute for a child, and *at least* 100 times per minute for an infant. Release pressure completely between compressions. After every five compressions, give one rescue breath (see Figure 28.5). Complete 20 continuous cycles (just over 1 minute) of CPR, and then check for signs of circulation. Continue CPR, checking for signs of circulation every few minutes. If the victim shows signs of circulation, stop chest compressions and continue rescue breathing if necessary (one rescue breath every 3 seconds).





First Aid for Shock

When something happens to reduce blood flow throughout the body, limiting the amount of oxygen carried to the cells, shock may occur. **Shock** is a failure of the cardiovascular system to keep an adequate supply of blood circulating to the vital organs of the body. This life-threatening emergency requires immediate medical attention. Common symptoms of shock include restlessness or irritability; altered consciousness; nausea; pale or ashen appearance; cool, moist skin; and rapid breathing and pulse.

If you suspect a head or spinal injury, don't move the victim. Otherwise, have the victim lie down if he or she has not already done so. This position often minimizes pain and keeps the victim calm. You should also:

- ▶ phone 911 or the local emergency number.
- ▶ control any external bleeding.
- ▶ elevate the legs about 12 inches, unless you suspect head or back injury or broken bones involving the legs or hips. If you aren't sure, leave the victim lying flat. This helps the blood return to the heart.
- ▶ never give the victim anything to eat or drink. Eating or drinking could cause vomiting.
- ▶ reassure the victim.

First Aid for Choking

Choking occurs when a person's airway becomes blocked by food or object. If the obstruction is not removed, the victim can die from lack of oxygen within a few minutes.

To help someone who is choking, you must first recognize the signs. A person may clutch his or her throat with one or both hands, which is the universal sign for choking. The victim may also cough weakly, make high-pitched sounds, or turn blue in the face. If someone appears to be choking but can cough forcefully or speak, do not attempt first aid. A strong cough can expel the object from the airway.

If you suspect that someone is choking, ask, "Are you choking?" and look for the universal choking sign. Then ask, "Can you speak?" If the person cannot speak in reply, the airway is completely blocked and the victim needs immediate first aid.

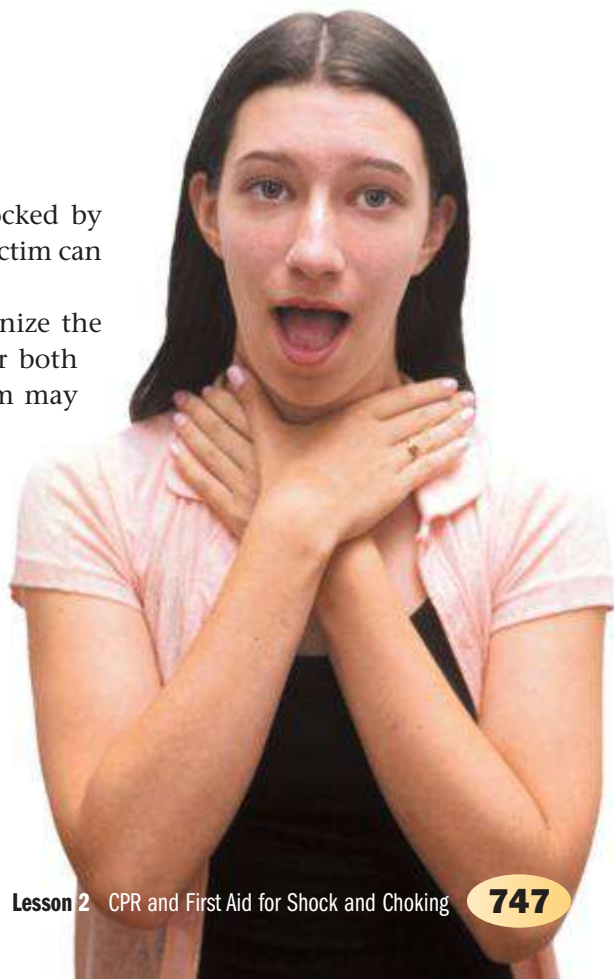
Did You Know?



One cause of shock is losing a large volume of fluid, usually as a result of bleeding. However, shock can result from a significant loss of any body fluids. This means that even diarrhea or vomiting, if prolonged and severe, can lead to shock.

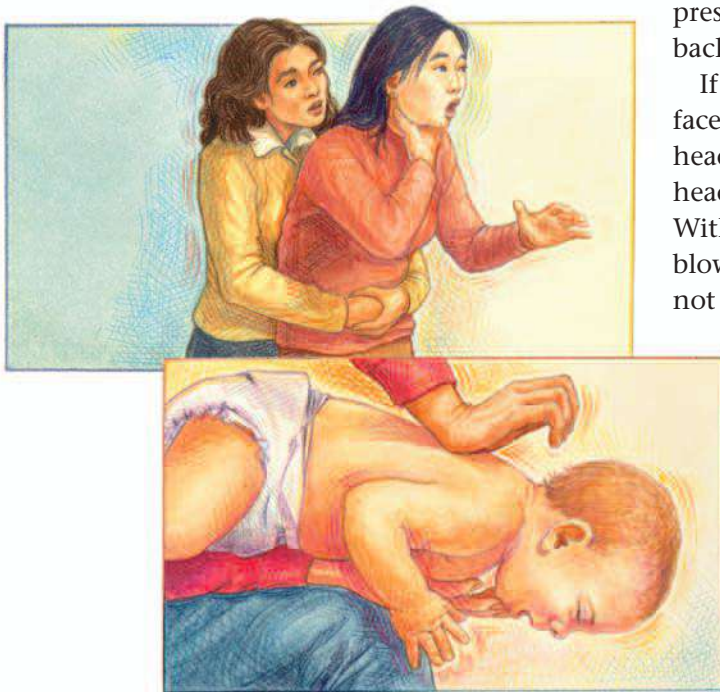


Be alert for the universal choking sign.





Use abdominal thrusts on a choking adult, but never on a choking infant. Use back blows alternating with chest thrusts for an infant. **Why do you think different methods are used for adults and infants?**



If the choking victim is an adult or a child, use abdominal thrusts—quick inward and upward pulls to the diaphragm—to force the obstruction out of the airway. To perform this procedure, stand behind the victim and place your arms around him or her. Make a fist with one hand, and grasp it with your other hand. Pull inward and upward just under the rib cage.

If you begin to choke while you are alone, use your own fist and hand to perform the procedure on yourself. You can also try pressing your abdomen forcefully against the back of a chair.

If the choking victim is an infant, hold the baby face down on your forearm. Support the infant's head and neck with your hand and point the head downward so that it is lower than the chest. With the heel of your hand, give the infant five blows between the shoulder blades. If the object is not dislodged, turn the infant over and perform five chest thrusts as described in the CPR section. Alternate the five blows between the shoulders with five chest thrusts until the object is dislodged or the infant begins to breathe or cough. Call 911 if the object is not dislodged within one minute. If the infant loses consciousness, phone 911 and begin CPR if you are trained and certified in the procedure.

Lesson 2 Review

Reviewing Facts and Vocabulary

1. Define *cardiopulmonary resuscitation*.
2. Why should you never give a shock victim anything to eat or drink?
3. What is the universal sign for choking?

Thinking Critically

4. **Evaluating.** Explain why it's important to check the airway before beginning CPR.
5. **Analyzing.** Compare the strategy for responding to a choking adult with the strategy for responding to a choking infant.

Applying Health Skills

Advocacy. Make a video encouraging teens to learn basic first-aid techniques for choking and shock. Make the video available to your class.



WORD PROCESSING Use a word processing program to write the script for your video. See health.glencoe.com for help in using word-processing software.



Lesson 3

Responding to Common Emergencies

VOCABULARY

fracture
unconsciousness
concussion

YOU'LL LEARN TO

- Analyze strategies for responding to accidental muscle, joint, and bone injuries.
- Analyze strategies for responding to accidental injuries resulting in unconsciousness.
- Analyze strategies for responding to accidental injuries such as animal bites.
- Analyze strategies for responding to nosebleeds and to foreign objects in the eye.



Write down three situations that come to mind when you hear the word *emergency*. Next to each situation, describe how you would respond to the emergency.

Suppose that you and a friend are out jogging when your friend falls and sprains an ankle. How can you be sure that the injury is a sprain and not a fracture? Would you know what to do in either case? As with major emergencies, knowing the proper response strategies when dealing with common emergencies can help prevent further injury or complications.

Muscle, Joint, and Bone Injuries

When too much stress is put on an area of the body, an injury may occur. These injuries vary in severity and can affect the bones, muscles, tendons, or ligaments. Some injuries, such as muscle strain, will usually feel better in a few days. Other injuries, such as a broken bone, may take several weeks to heal and require professional medical treatment for a full recovery to occur.

Bone, muscle, and joint injuries can be serious, but they are usually not life threatening.





Applying ice to a sprain reduces swelling and eases pain. *Why is it a good idea to see a health care professional if you suspect that you have a sprain?*

hotlink

R.I.C.E. For more information on R.I.C.E., see Chapter 4, page 102.

Muscle Cramps

A muscle cramp is the sudden and painful tightening of a muscle. Muscle cramps can occur when you are physically active or at rest. Some medications can also cause them. If a muscle cramp occurs:

- ▶ Stretch out the affected muscle to counteract the cramp.
- ▶ Massage the cramped muscle firmly.
- ▶ Apply moist heat to the area.
- ▶ Get medical help if the cramp persists.

Strains and Sprains

A strain is an injury to a muscle, usually resulting from overuse of the muscle. The symptoms of a strain include pain, swelling, bruising, and loss of movement caused by small tears in the muscle. A sprain is an injury to a ligament. Sprains usually result from a sudden twisting force. Sprains also cause pain and swelling from badly stretched or torn ligaments. Although serious sprains require professional medical attention, minor sprains and strains may be treated with the **R.I.C.E.** procedure:

- ▶ **Rest**—Avoid any movements and activities that cause pain, including any use of the affected muscle or joint. Help the victim find a comfortable position.
- ▶ **Ice**—Ice helps reduce pain and swelling. Place ice cubes in a plastic bag, and wrap a towel or cloth around the bag. Hold the bag on the affected area for 20 minutes, remove it for 20 minutes, and then reapply it. Repeat this process every 3 waking hours over the course of 72 hours.
- ▶ **Compression**—Light pressure from wearing an elastic wrap or bandage can help reduce swelling. The wrap should be firm but not uncomfortable.
- ▶ **Elevation**—Raising the affected limb above the level of the heart helps reduce pain and swelling.

Fractures and Dislocations

Fractures and dislocations are similar. A **fracture** is a break in the bone. If a joint is under extreme stress, it may dislocate, or disconnect. First-aid procedures are the same for both fractures and dislocations. If possible, keep the victim still and call 911. If the victim must be moved, keep the fractured area immobilized by securing a splint to the body part with clean lengths of cloth. You can fashion a splint from everyday materials such as rolled newspapers and heavy cardboard. Seek professional medical care immediately.





Unconsciousness

Unconsciousness is a condition in which a person is not alert and aware of his or her surroundings. There are different levels of unconsciousness, ranging from drowsiness to coma. An unconscious victim can choke to death because of his or her inability to cough, clear the throat, or react to a blocked airway. The primary goal when providing first aid to an unconscious victim is to prevent choking until professional medical help arrives. If the victim is unconscious, place him or her in the recovery position shown in **Figure 28.7** and seek professional medical help immediately.

Fainting

Fainting occurs when the blood supply to the brain is temporarily inadequate. Loss of consciousness is usually brief. Although fainting doesn't always indicate a medical problem, it might be symptomatic of a serious disorder. Treat fainting as a medical emergency until the symptoms are relieved and the cause is known.

If you feel faint, lie down or sit down and place your head between your knees. If someone else faints, position the person on his or her back with legs elevated 8 to 12 inches above the heart unless you suspect head or neck injury. Do not place a pillow under the person's head. This can block airflow. Loosen any tight clothing. Sponge the person's face with water. Do not splash water on the face; this may cause the person to choke. If the person vomits, quickly roll him or her into the recovery position shown in **Figure 28.7** to prevent choking. If the person fails to revive promptly, seek medical help.

CHARACTER CHECK

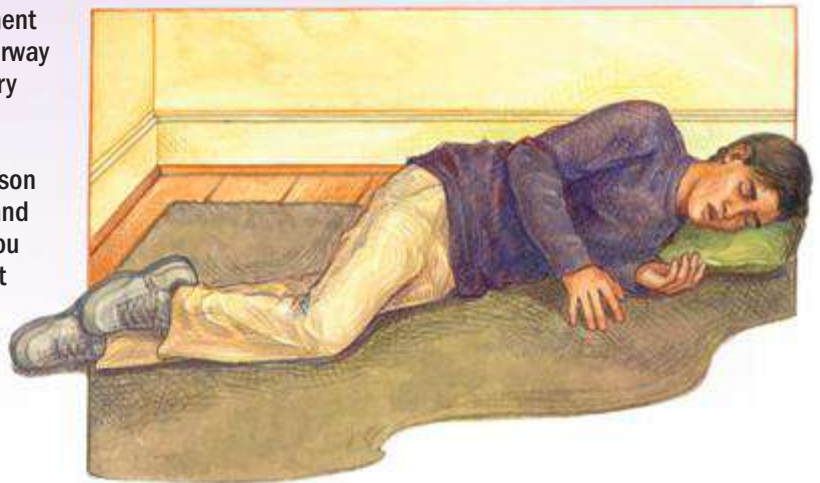
Citizenship. If you see someone who has just suffered an injury, don't assume that someone else will stop and help. Everyone else might be making that same assumption. **Be a responsible member of your community. If you see someone who needs medical assistance, do what you can to help, even if all you can do is call 911.**

FIGURE 28.7

THE RECOVERY POSITION

The recovery position is the safest placement for an unconscious person because the airway is protected. Put the person in the recovery position only if no spinal or head injury is suspected.

This position helps an unconscious person breathe and allows fluids such as blood and vomit to drain. Do not move a person if you suspect spinal or head injuries. Movement can worsen these injuries.





Concussion

A **concussion** is a jarring injury to the brain that affects normal brain function. Even if there are no external signs of injury, the brain can strike the inside of the skull and be damaged. To avoid causing spinal injury, do not move an unconscious victim if you suspect a head injury or concussion. Check the person's airway, breathing, and circulation, and get professional medical help immediately. If you suspect that a person has a concussion:

- ▶ Have a conscious victim lie down.
- ▶ Use first aid for any bleeding.
- ▶ If the victim is unconscious and you do not suspect head or neck injury, place him or her in the recovery position, as shown in **Figure 28.7** on page 751. Call 911 immediately.



Never approach a strange dog. Always ask the owner's permission before approaching or touching a dog that you do not know. **What two diseases are associated with animal bites?**

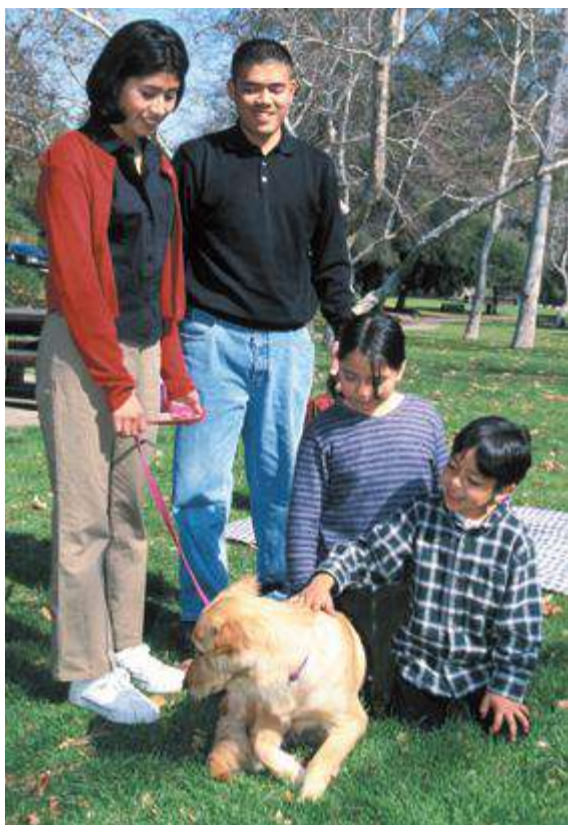
Animal Bites

One of the most serious possible consequences of an animal bite is rabies, a viral disease of the nervous system that if left untreated eventually causes paralysis and death. There is no cure for rabies after symptoms develop. However, if a person is vaccinated promptly after being bitten, he or she can develop immunity before symptoms appear.

When someone is bitten, report the incident to your community health department or animal control department. It's important to determine whether the animal has rabies. If you find the animal, do not try to capture it. Give its description and location to the proper authorities or the police. The animal will be captured for testing and observation.

Animal bites also carry the risk of infection, including tetanus, an often fatal disease. Although tetanus can be treated, the treatment is long, difficult, and often unsuccessful. Tetanus can be prevented, however, by keeping your immunizations up to date. First aid strategies for animal bites includes the following:

- ▶ Wash the bite area with mild soap and warm water for five minutes to remove saliva and any other foreign matter.
- ▶ Use direct pressure or pressure point bleeding control to stop any bleeding.
- ▶ If the wound is swollen, apply ice wrapped in a towel for 10 minutes.
- ▶ Cover the wound with a clean dressing or bandage.






Nosebleeds

Nosebleeds often occur if the nose is struck or if the mucous membranes in the nose dry out from breathing dry air. Seek professional medical attention if nosebleeds occur often.

To treat a nosebleed, keep the person quiet. Walking, talking, and blowing the nose may increase bleeding. Tell the person to breathe through his or her mouth. Have the person sit down and lean forward. Do not tilt the person's head back—doing so may cause the person to choke as blood runs down the back of the throat. Using a protective barrier, press on the bleeding nostril. Maintain pressure for 15 minutes. If the person's nose is still bleeding after 15 minutes, repeat the procedure. If bleeding continues, seek professional medical help.



 Applying direct pressure to a nosebleed usually stops the bleeding. **Why might dry air cause a nosebleed?**

Hands-On Health ACTIVITY

First-Aid Stations

In this activity you will set up learning stations for common emergencies and rotate through them.

What You'll Need

- pen or pencil and notebook paper
- poster board and markers
- props (optional)

What You'll Do

1. In small groups, research the following information for the emergency assigned by your teacher:
 - how to recognize it
 - appropriate steps to take in the correct sequence
 - what to do after first aid has been provided
2. Decide on a creative way to present your material at a learning station,

such as a poster, a board game, a quiz show, a puzzle, a news story, or demonstrations with props such as bandages.

3. Each group will set up a learning station. One person in each group coordinates the activities at each learning station while all other students rotate through the stations. Group members take turns supervising their station.

Apply and Conclude


Write a script for a skit about a teen or a group of teens who encounter a medical emergency. The script should show one teen experiencing the emergency while the others administer proper first aid.



Object in the Eye

Foreign objects such as dirt, sand, and slivers of wood or metal that enter the eye are irritating and can cause damage. Encourage the victim not to rub the eye, an action that may scratch the cornea, but to blink several times. If blinking does not dislodge the object, try to find it in the eye. First, wash your hands. Gently pull the lower eyelid down while the person looks up. If you don't see anything, hold the upper lid open and examine the eye while the person looks down. If you see the object on the surface of the eye, lightly touch it with a moistened cotton swab or the corner of a clean cloth.

You can also flush the eye with sterile saline solution or tap water. If the person is wearing contact lenses, do not remove the lens before flushing the eye. To flush the eye, tilt the person's head to the side so that the affected eye is lower than the unaffected eye. Gently hold the eye open with one hand. With the other hand, pour a steady stream of cool water into the eye, from the inside corner toward the outside corner. The water should wash over the surface of the eye. Seek professional medical help if the object is not removed.

-  To flush an object out of your own eye, gently pour water from a small clean glass into the eye.



Lesson 3 Review

Reviewing Facts and Vocabulary

1. What is a *fracture*?
2. What is the primary goal when providing first aid to an unconscious person?
3. What are two common causes of nosebleeds?

Thinking Critically

4. **Analyzing.** While hiking with you, a friend stumbles on a tree root and falls. By the time you get home, her ankle is badly swollen and she can't walk without leaning on you. Analyze and describe the strategy you would use to respond to this accidental injury.
5. **Evaluating.** Why should you seek professional medical care if a sprain or strain doesn't improve or if you suspect that the injury might be a fracture?

Applying Health Skills

Accessing Information. Use online and print resources to find additional information about rabies. Using the information you have obtained, write a newspaper article about giving first aid to someone who has been bitten by an animal, including how to prevent rabies.



WEB SITES Use your newspaper article as part of a Web site you develop on rabies. See health.glencoe.com for help in planning and building your Web site.



health.glencoe.com



Lesson 4

Treatment for Poisonings

VOCABULARY

poison

venom

poison control center

YOU'LL LEARN TO

- Analyze strategies for responding to accidental injuries such as poisonings.
- Analyze strategies for responding to accidental injuries such as bites and stings.
- Analyze strategies for preventing and responding to accidental injuries such as skin irritation caused by contact with poisonous plants.



Accidental poisonings are often associated with toddlers. What are some safety procedures that can help prevent accidental poisoning in a home with young children? Compile a list of at least five tips.

Knowing how to respond to accidental poisoning injuries is an important part of first aid. A **poison** is any substance—solid, liquid, or gas—that causes injury, illness, or death when introduced into the body. Approximately 90 percent of poisonings occur in the home, and more than half of these poisonings involve children under the age of six.



Types of Poisoning

Poisoning results when substances that are not meant to enter the body do so. The substance could be a chemical that is swallowed, a pesticide that is absorbed through the skin, or **venom**, a poisonous substance secreted by a snake, spider, or other creature, that is injected into the body through a sting or bite. Even certain plants and foods can be poisonous. Gases or vapors may also be poisonous, such as carbon monoxide from hot water heaters and furnaces, exhaust fumes from automobiles, and fumes from gas- or oil-burning stoves. Your poison control center can tell you the correct procedure to follow in the event of a poisoning. A **poison control center** is a 24-hour hot line that provides emergency medical advice on treating poisoning victims.



Many household products become poisons if they are used incorrectly.

Where can you find information about the toxicity of various household products?





Poison can enter the body in four ways: ingestion, inhalation, absorption, and injection. **What can you do to prevent accidental poisonings?**



First Aid for Poisoning

Proper treatment of poisoning requires professional guidance. The best resource in handling poison emergencies is the local poison control center. Have the phone number of your poison control center posted near your phone.

Time is critical when a poisoning has occurred. Some poisoning situations require quick action to minimize the amount of damage to the victim or to prevent death. First, call 911 for help. Then practice these first-aid strategies for poisonings.

- ▶ **Swallowed poisons** vary in their first-aid treatment because the substances that can be swallowed affect the body differently. Quickly try to determine what was swallowed, and call your poison control center. Follow the instructions given to you. It is important that you call the poison control center first. You may be instructed to give the victim something that dilutes the poison, such as milk or water, or you may be directed to induce vomiting. Do not try to induce vomiting unless you are told to do so. Some poisons can be aspirated into the lungs and cause even more damage; others can burn the esophagus if the victim vomits.
 - ▶ **Inhaled poison** is serious because of the damage that can be done to the lungs and other organs of the respiratory system. Quickly get the person to fresh air. Do not breathe in the fumes. If the victim is not breathing, start rescue breathing.
 - ▶ **Poison on the skin** must be removed as quickly as possible to limit the exposure to the body. Remove contaminated clothing. Rinse skin continuously with water for 15 minutes. Then rinse the skin with mild soap and water. Rinse again with fresh water. If possible, have someone call 911 while you are rinsing the skin.
 - ▶ **Poison in the eye** is absorbed quickly. Immediately start flushing the eye with lukewarm water and continue for 15 minutes. Have the victim blink the eye as much as possible while flooding the eye. Do not force the eye open, and do not rub the eye. Have someone call 911 while you are rinsing the eye.
- When you call the poison control center:
- ▶ Be prepared to give your name, location, and telephone number.
 - ▶ Provide the name of the substance, when it was ingested, and the amount involved. If possible, give the brand name of the product and a list of the ingredients.
 - ▶ Describe the state of the victim, as well as his or her age and weight.
 - ▶ Be prepared to follow instructions and answer any questions.



Real-Life Application

Contacting a Poison Control Center

Poisonous products often display warning labels that provide instructions on what to do if someone swallows, inhales, or has skin or eye contact with the product. For cases of poisoning in which the specific product is known, use this information when you contact the poison control center.

The WORKS Toilet Bowl Cleaner

WARNING: KEEP OUT OF REACH OF CHILDREN
CONTAINS: HYDROXYACETIC ACID *

FIRST AID:
If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, * and then continue rinsing eye.
If on skin or clothing: Remove contaminated clothing. * Rinse skin immediately with plenty of water for 15-20 minutes.
If swallowed: Have person sip a glass of water if he or she is able to swallow. Do not induce vomiting unless told to do so by a poison control center. * Do not give anything by mouth to an unconscious person. *

Why is it important for a poison control center to know the specific poison?

Why should you remove contact lenses if a chemical has entered the eye?

Why must contaminated clothing be removed at once?

What is a poison control center? Where is the one nearest you?

Why is it dangerous to give an unconscious person something to drink?

ACTIVITY

With a partner, role-play a scenario that involves contacting a poison control center when a child has ingested the product shown above. Write your dialogue, and then practice asking and giving information clearly and calmly. One of you will be the caller; the other will be a health professional at the poison control center. The latter will ask for the caller's name and telephone number, as well as questions about

- the child's condition, age, and weight.
- the suspected poison and what instructions/warnings/ingredients appear on the label.
- the time the poisoning may have occurred.
- what first aid the caller may have already provided.

Conclude the role-play with what you think the health professional might tell the caller to do. Then switch roles and repeat the role-play.

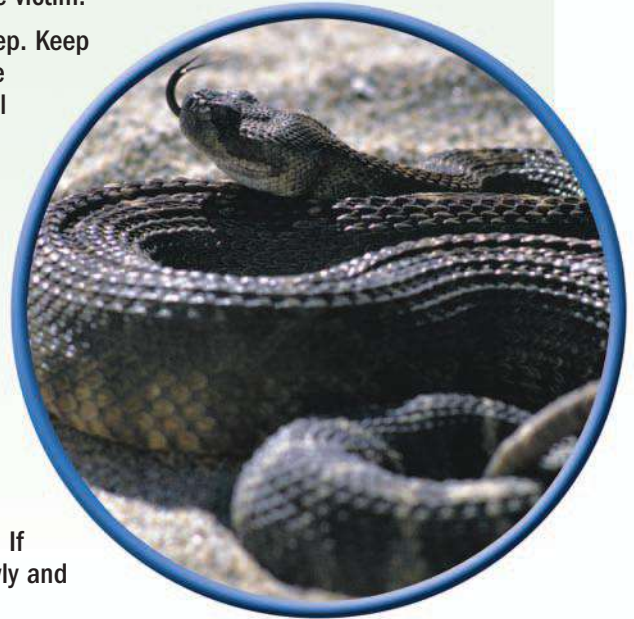


FIGURE 28.8

FIRST AID FOR SNAKEBITE

Use the following steps to administer first aid to a snakebite victim:

- Get the victim to a hospital. This is the most important step. Keep the victim calm and in a reclining position, if possible. The more the victim moves, the greater the risk that venom will circulate throughout the body.
- Keep the bitten area at or below the level of the heart. If the bitten area is on a limb, immobilize that limb.
- Call 911, or have someone else do so. Follow any instructions that are given.
- Do not apply ice or heat. Applying heat will diffuse the venom more rapidly. Applying ice will cause tissue damage. Also, do not give the victim aspirin or other drugs. Some substances can interact dangerously with the venom or thin the blood, causing the venom to spread more rapidly into tissues.
- Maintain breathing and prevent aggravation of the wound. If you are the victim of a snakebite and are alone, walk slowly and rest periodically to help minimize blood circulation.



First Aid for Poisonous Bites and Stings

Insect and animal stings and bites are among the most common sources of injected poisonings. A poisonous bite or sting can come from several sources, including insects, spiders, ticks, scorpions, snakes, marine life, and other animals.

Snakebite

There are about 20 species of venomous snakes in the United States. Most are rattlesnakes, copperheads, coral snakes, and water moccasins (also called cottonmouths). Usually, the bite of a venomous snake is not fatal; however, a bite can cause severe pain, loss of function, and, in rare situations, loss of a limb. The first-aid procedures for snakebite are found in **Figure 28.8**.

Insect Bites and Stings

Some insects, such as the bee, hornet, yellow jacket, wasp, and fire ant, cause painful stings that can produce a strong allergic reaction. For people who are highly allergic to the venom of these insects even one sting can cause a life-threatening condition. These people need immediate medical attention if they are stung. However, for most people, insect bites are uncomfortable but not life threatening. Follow these first-aid procedures for insect bites and stings:




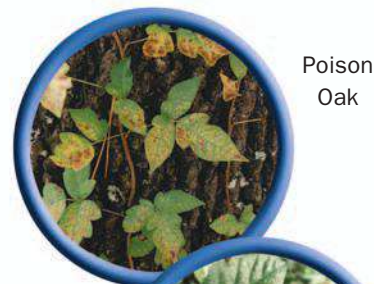
- ▶ Move to a safe area to avoid further harm. Try to remove the stinger by scraping it off with a firm, sharp-edged object such as a credit card or fingernail.
- ▶ Wash the area with mild soap and water to help prevent infection. To reduce pain and swelling, apply a cold compress. Apply hydrocortisone cream, calamine lotion, or a baking soda paste to the area several times a day until the pain is gone.
- ▶ If the victim was bitten by a venomous spider or scorpion and begins to have trouble breathing or shows other signs of a severe reaction, call 911 immediately.

First Aid for Poisonous Plants

About 85 percent of Americans will develop an allergic skin reaction if exposed to poison ivy, poison oak, or poison sumac. Symptoms include blistering, swelling, burning, and itching at the point of contact, and the person may develop fever.

The first defense against poisonous plants is to recognize and avoid them. If you come into contact with a poisonous plant, remove contaminated clothing. Flush affected areas with water, and then wash thoroughly with soap and water. Certain over-the-counter preparations can be used to wash the affected areas. If a rash develops, use calamine lotion to relieve the itching. For severe discomfort or pain, seek medical attention.

 These are common poisonous plants.



Poison Oak



Poison Ivy



Poison Sumac

Lesson 4 Review

Reviewing Facts and Vocabulary

1. Define the terms *poison* and *venom*.
2. What information should you have ready when you call a poison control center?
3. Analyze and describe the strategy for responding to accidental injuries such as insect bites and stings.

Thinking Critically

4. **Analyzing.** Analyze and describe a strategy for preventing an accidental poisoning injury in your kitchen.
5. **Synthesizing.** Develop a list of items needed to administer first aid to a bee-sting victim who is not allergic to bee venom.

Applying Health Skills

Practicing Healthful Behaviors. Prepare a pamphlet that shows the first-aid procedures for responding to poisonings. Include each type of poisoning mentioned in this lesson. Make your pamphlet available to other students in your school.

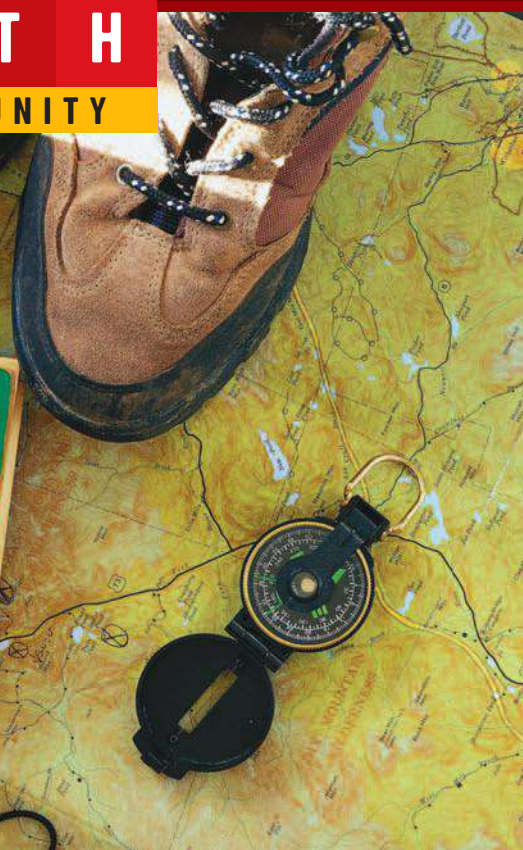


PRESENTATION SOFTWARE Use the material from your pamphlet and computer software to create a presentation. See health.glencoe.com for information on how to create a presentation.



Wilderness 911

If you like to hike, camp, or sail, there's more to first aid than you might think.



For many teens, camping is a great way to relax and have fun with family and friends. While the nearby state park may not be back-country, medical help isn't always nearby. So a quick class on wilderness first aid might be what the doctor ordered—especially when the nearest hospital is more than an hour away.

Why “an hour or more”? Doctors have identified a “golden hour” just after accidents, heart attacks, and other emergencies in which they can do the most to save lives.

Learning the Rules

Practicing wilderness first aid ensures that at least some of the benefits of treatment within the golden hour are not lost. In urban first aid, for example, you're taught to splint a suspected sprain, strain, or fracture as close as you can to the position you found it in. Under wilderness conditions, you need to be alert to the possibility that nerves or the blood supply in the affected limb may have been cut off. For that reason, you must pull gently and straighten out the limb before splinting to restore circulation and

sensation. Otherwise, the accident victim could permanently lose use of that arm or leg. As a rule, if you're not seriously injured and you know your way back and can move under your own power, it's better to hike out than wait for rescue.

A good first-aid class will stress prevention. For example, make sure to carry plenty of food, water, and extra clothes—even if you're just out for the afternoon. A sudden change in the weather or a broken leg could turn your stroll into an uncomfortable night outdoors. That's why you should take something to insulate you from the ground and prevent hypothermia. ■

TIME
to THINK...

**About
Wilderness
Safety**

The article mentions the condition *hypothermia*. Create a first-aid pamphlet with the class that describes symptoms, prevention, and treatment of hypothermia. Make sure you include specific information. Would you feel confident in giving the pamphlet to a friend who was going camping?



Health Skills Application



1. Advocacy. Prepare a talk that encourages younger students in your community to learn first aid. Compile lists of local emergency telephone numbers for distribution. (LESSON 1)



2. Analyzing Influences. Evaluate the effect of technology on first aid. For example, what techniques and capabilities are available today that were not available 50 years ago? (LESSON 2)



3. Accessing Information. Research to learn whether your state has a high incidence of rabies and what measures are taken to keep the disease under control. (LESSON 3)



4. Practicing Healthful Behaviors. Find out which poisonous plants are in your area, how they can be recognized, and what to do in case of exposure to them. Use what you have learned to create a teaching tool, such as a poster or a comic book, for elementary school children. (LESSON 4)

CAREER Corner

Emergency Physician

Can you make fast and accurate decisions? As an emergency physician, you often have to make quick diagnoses under extreme conditions. You also need to be able to communicate.

To become an emergency physician, you need a four-year college degree and a medical degree. After finishing medical school, you'll need one year of internship and two to three years of residency. Find out more about this and other health careers by clicking on Career Corner at health.glencoe.com.



BEYOND the Classroom

Parent Involvement

Accessing Information.

Learn more about where members of your community can become certified in CPR. With your parents, find out how your family can become involved in promoting CPR certification for everyone. If classes are not available in your community, find out how you can arrange for someone to provide classes in your community.



School and Community

CPR Certification. Train to become certified in CPR. Then research to find out how you can volunteer to help teach others the life-saving techniques of CPR.



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Chapter 28 Review

After You Read

Use the notes you have taken in your Foldable to review what you have learned about the three Cs. On the back of your Foldable, record what you have learned about different types of injuries.



▶ EXPLORING HEALTH TERMS *Answer the following questions on a sheet of paper.*

Lesson 1 *Match each definition with the correct term.*

universal precautions first aid

1. The immediate, temporary care given to an ill or injured person until professional medical care can be provided.
2. Actions taken to prevent the spread of disease by treating all blood and other body fluids as though they contained pathogens.

Lesson 2 *Match each definition with the correct term.*

defibrillator shock
chain of survival
cardiopulmonary resuscitation

3. A failure of the cardiovascular system to keep an adequate supply of blood circulating to the vital organs of the body.
4. A device that delivers an electric shock to the heart to restore its normal rhythm.
5. A sequence of actions that maximize the victim's chances of survival.

Lesson 3 *Fill in the blanks with the correct term.*

concussion unconsciousness
fracture

A blow to the head can cause a (6), which is a jarring injury to the brain, without actually causing (7). If the blow is hard enough, it can cause a skull (8).

Lesson 4 *Fill in the blanks with the correct term.*

venom poison
poison control center

A (9) provides emergency medical advice on treating poisoning victims. Snake (10) is a (11) when it is introduced into the human body.

▶ RECALLING THE FACTS *Use complete sentences to answer the following questions.*

1. What are two universal precautions that a person should follow when giving first aid to another person?
2. What are the first three things you should do when you recognize an emergency situation?
3. What are the four types of open wounds?
4. What is the chain of survival for adults?
5. What are the ABCs of CPR?
6. What are the symptoms of shock?
7. What is the first-aid procedure for a person who has a muscle cramp?
8. What is the first-aid procedure for a person who has fainted?
9. Why is the recovery position the safest position for a person who is unconscious?
10. What is the first-aid procedure for a person who has inhaled poison?
11. What is the first-aid procedure for poison in the eye?
12. Why is it important to wash a poisonous bite or sting with mild soap and water?



**▶ THINKING CRITICALLY**

- 1. Applying.** While you are jogging through town with some friends, you see that a car has just struck someone on a bicycle. Analyze and describe a strategy for responding to this type of accidental injury.
- 2. Synthesizing.** Why can quick abdominal thrusts dislodge an obstruction in the airway?
- 3. Analyzing.** Explain why you should not try to capture an animal that has bitten someone.
- 4. Evaluating.** Which of the first-aid techniques covered in the chapter would be especially important for a camper or hiker to know? Explain your choices.

TAKS**Test Practice**

Read the passage below, and then answer the questions.

Tornado Hits School

OZDEN, KANSAS — A tornado smashed windows and blew off the doors of an elementary school here, leaving a teacher injured. The tornado later touched down again in an area a mile from the school, causing damage to a convenience store, a small airport and a number of homes.

The twister first touched down near Ozden Elementary School and injured a teacher who was standing outside the building at the time. Another 30 children under the supervision of the physical education teacher were outside on a playground adjacent to the building. Since the playground was next to the building, the instructor was able to rush the children into the building

as soon as she spotted the oncoming tornado. Teachers and staff inside the school took students to hallways in the center of the building before the tornado hit. The storm broke out the school's front door and most of the windows.

"We are thankful that no students were seriously injured in the storm," said Principal Kim Bruno.

The teacher caught outside was not so lucky. According to witnesses, the storm actually picked him up off the ground and dropped him down. He was found lying on the ground, covered with mud and bleeding from a cut on his head. He is listed in satisfactory condition at in the County Hospital, according to Ms. Bruno.

1. What is the news story mainly about?
 - A** the damage caused to a school by a tornado
 - B** the bravery of the physical education teacher
 - C** the injuries to a teacher who was caught outside
 - D** the damage that tornadoes cause
2. Which word or phrase helps readers understand the meaning of the word *adjacent*?
 - A** outside
 - B** next to
 - C** oncoming
 - D** touched down
3. Write a newspaper article describing an event such as a tornado or hurricane that has occurred in your area.